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ON THE GEOGRAPHICAL DISTRIBUTION OF SEALS.*

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PINNIPEDS form a very natural and circumscribed suborder of Mammalia, and some of the facts of their comparative anatomy, habits, and geographical distribution are in favour of the hereditary derivation of different species from the same ancestry—the doctrine of Evolution.

J. W. Dawson, in his excellent little work, 'The Chain of Life in Geological Time,' written ostensibly to controvert the evolutionary theory, remarks of Seals, "They are more elevated than Whales in type, appear much later, and without any probable ancestry." The latter part of this sentence I cannot accept. In the first place, notice the close affinities which constitute Pinnipeds a natural suborder. They are all distinctly marine in their habits; with two exceptions, never frequenting rivers or lakes at any distance from the sea. There are two other marine mammalian suborders inhabiting similar localities —the *Sirenia* (Dugongs and Manatees) and the *Cetacea* (Whales). From these they are distinguished by the fact that they are all well covered with hair or fur; have hind as well as fore limbs; tail small, in no case broadened into the piscine-like member of the other two groups; and possess also the power of erecting and turning the head with a double angle, more or less like the letter Z, in a dog-like way. This, in the eye of common

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* A lecture, delivered at the Plymouth Institution.

RITISH MUSEUM

observation, has always saved them from the ignominy reserved to cetaceans of being generally classed with fishes.

Another striking point of affinity in which they differ from other marine mammals is that they all bring forth and suckle their young out of the water, for which purposes they resort to rocks, beaches, or ice; and it is on this necessity in their economy that the hunters place their principal reliance for a supply. These rendezvous, to which many of the species resort in vast numbers, are sedulously sought for, and in some cases carefully preserved. In others indiscriminate slaughter has sometimes destroyed the whole species inhabiting the locality.

The characters of their teeth differ entirely from those of the Sirenia which have broad or flat-topped teeth, suitable for vegetable feeding, and closely approximate the terrestrial Carnivora, on the one hand, whilst on the other they show a slight tendency to degenerate towards the dentition of the Dolphins, and as this point is interesting as suggesting a possible derivation for the latter cetaceans, it will be dealt with a little more in detail.

In the skull of an Icthyosaurus we have a long series of slightly recurved acute cones arranged along the sides of each jaw in two nearly parallel or converging lines, continued so as to meet in the front of the mouth. As we advance higher in the scale of life these teeth are gradually differentiated, those in front becoming chisel-shaped for cutting, those at the angle being greatly elongated and strengthened for seizing; those next in order shortened and made more blade-like for splitting or breaking; and those behind blunted on their crowns and gradually transformed into grinders. The differentiation between these teeth at first is not very marked, the intermediate teeth often partaking of an intermediate character; but as the teeth become more highly specialized the intermediate forms are eliminated, the jaws shortened, and the teeth reduced to four or fewer definite classes of teeth, each being often very distinct from its neighbours. These four classes are known as incisors, canines, premolars, and molars.

In the land Carnivora these teeth are all more or less marked. They have six incisors above and below with one or two exceptions, two canines above and below of the highest type, and behind these, premolars and molars of at least two definite forms and functions ranging from a large amount of grinding surface in some mixed feeders, as Bears and Badgers; to teeth almost entirely formed for splitting bones and cutting flesh, as in the Cats, &c.

The Dolphins show a degradation, or reversion, towards the older type of animals which had long narrow jaws, and rows of similar conical teeth.

Seals show some tendency in the same direction, inasmuch as whilst their general cranial and dental aspect is unmistakably canine or leonine, the teeth behind the canines approximate more or less to this type of a series of cones. The teeth of various genera and species differ a good deal, but they all agree in this, that in each species all the teeth behind the canines are similar; there are not here as in the land Carnivora two or more distinct sorts of teeth,—and where the species differ, they still keep up the type of a series of recurved, more or less acute cones.

A very early form of carnivorous tooth was perhaps taken as the pattern of an old-fashioned spear-head, having a central sharp blade supported on each side by two smaller cusps to help give it grip and steadiness in action; such teeth are quite common in the land Carnivora, as anyone may judge by examining a cat or dog. Such teeth are the basis of the pattern of the back-teeth of Seals.

Sometimes, as in *Lobodon carcinophaga*, a Seal from the Antarctic Seas, there are three minor cusps behind the principal one, as well as one in front, making five, whilst in others, as in our own *Halichærus grypus*, the inferior cusps are reduced to a mere indication, and the teeth have all nearly arrived at the degradation of a merely conical type. Still in each case all the teeth behind the canines are similar.

Pinnipeds include the Eared Seals (*Otariidæ*), the "Sea Lions," and Fur Seals: the Walruses (*Odonbænidæ*) and the ear-less or true Seals (*Phocidæ*) comprising the Common Seals, the "Sea Leopards" of the South Pacific, and the "Sea Elephants." It has often been suggested that an affinity between the Walrus and the Dugong is indicated by the tusks of the latter; but the relationship is only superficial, the tusks of the Dugong being enlarged incisors, while those of the Walrus are the canines. The Dugong is a true vegetable-feeder, whilst the Walrus—in spite of a recent writer in the 'Century'

Magazine, who considers it a vegetable-feeder—is a true carnivore, the peculiar conformation of the skull being correlated with the support and use of its enormous tusks. With these it digs up the mollusca which form its principal food.

The *Otariidæ*, or Eared Seals, form the first division; these are chiefly distinguished from their congeners by the following characters:—They all possess external ears or conches, turn the hind limbs forward to aid in terrestrial progression, and are distinctly and jealously polygamous in their habits. Some of the species are commercially valuable, as furnishing the "sealskin" of fashion; these, which are known as "Sea Bears," are smaller than those without this valuable coating, which are called "Sea Lions."

In his 'History of N. American Pinnipeds,' Mr. Allen recognizes nine species of *Otariidæ*, of which five are hair Seals, or Sea Lions, and four are fur Seals; but as they are very widely distributed and still imperfectly known, there are probably a greater number. They are:—

1. *Otaria jubata*. The large "Sea Lion" of the south coasts of South America.
2. *Phocarctos hookeri*. Auckland Isles.
3. *Eumetopias stelleri*. The large northern "Sea Lion" of the coast of California, and North of Japan.
4. *Zalophus californianus*. The lesser "Sea Lion" of California and Farallone Islands.
5. *Zalophus lobatus*. The lesser "Sea Lion" of the Australian coast, with soft under fur.
6. *Callorhinus ursinus*. The northern Fur Seal of California and Japan northward to Behring Strait.
7. *Arctocephalus australis*. Round the south coast of South America, from Galapagos Isles to Rio de la Plata.
8. *Arctocephalus antarcticus*. Cape of Good Hope.
9. *Arctocephalus forsteri*. The Fur Seal of Australia and New Zealand.

Of the Walruses, Mr. Allen labours hard to establish two species, which he names:—

1. *Odobænus rosmarus*. The Walrus of the North Atlantic and Arctic Oceans.
2. *Odobænus obesus*. The Walrus of the North Pacific.

The differences which he points out, however, are slight, and as the 'Vega,' in its N.E. passage to the Pacific, found the Walrus in nearly all parts of the Arctic Ocean, it seems more probable that his second species is only a variety which has attained a larger size than its congener by obtaining better food, or being less disturbed.

The Walrus is ear-less, like the true Seals, but differs from them in its huge canines, and in the fact that it bends its hind legs forward to assist in progression on ice or land. It is also truly Arctic in habitat, abounding in all parts of the Arctic Ocean from which it has not been driven by man. Mr. Allen speaks of it as polygamous in its habits, whilst other authors assert it to be monogamous; it is, at any rate, not so decidedly polygamous as the *Otariidæ*.

The true or ear-less Seals have hairy bodies, but no fur, have the hind limbs bent backwards so as to serve as a tail in swimming, and are incapable of turning them forward to assist in progression on land. The most noticeable species are:—

1. *Phoca vitulina.* The common Seal of our Islands; ranges all round the Arctic Circle from the North Atlantic to the North Pacific and Japan.
2. *Phoca grœnlandica.* The Greenland Seal, the Seal of the Newfoundland and Jan Mayen Fisheries.
3. *Phoca fœtida.* North Atlantic, North Pacific, and Arctic Oceans.
4. *Phoca caspica.* Caspian and Aral? Seas.
5. *Phoca siberica.* Lakes Baikal and Oron?
6. *Histriophoca fasciata.* The Ribbon Seal of the North Pacific.
7. *Erignathus barbatus.* The Great Seal of the Arctic Circle from the Atlantic to the Pacific.
8. *Halichœrus grypus.* The Grey Seal of North Britain and Newfoundland northwards.
9. *Monachus albiventer.* Mediterranean and Black Seas, Canaries, East Coast of Africa.
11. *Cystophora cristata.* The Bladder-nosed Seal, North Atlantic and Arctic.
12. *Macrorhinus leoninus.* Sea Elephant, South Pacific, South Indian, and Antarctic Seas.
13. A variety of above. Coast of West Mexico and South California.

Four Sea Leopards in Antarctic and South Pacific, New Zealand, Lord Howe's Islands, &c.; *viz.*:—

14. *Ogmorhinus leptonyx.* New Zealand coast.
15. *Lobodon carcinophaga.* Antarctic Seas.
16. *Leptonychotes weddelli.* East Patagonia.
17. *Ommatophoca rossi.* Antarctic Seas.

Of these it will be seen that four, namely, *P. vitulina*, *P. grœnlandica*, *P. fœtida*, and *E. barbatus*, range from the North Pacific across the Arctic into the North Atlantic.

One, viz., *H. fasciata*, has its habitat where the North Pacific and Arctic join.

Two, viz., *H. grypus* and *C. cristata*, range down from the Arctic Ocean north of the Atlantic, into the latter ocean.

One, *Monachus*, is certainly found in the Mediterranean and tropical Atlantic, although the Seal of the West Indies is supposed to be of a distinct species. (See Zool. 1887, p. 191.)

One, *Macrorhinus*, is found in the tropical Pacific, coasts of Lower California and Mexico, and in the South Pacific and South Indian, and Antarctic Oceans; whilst four species of the genus *Leptonyx* are found in the Antarctic Ocean and the southern parts of the oceans bordering thereon.

One great distinguishing feature between the true Seals and the Eared Seals is evident. The true Seals and the Walrus are more capable of bearing cold, and as none of the *Otariidæ* reach above Behring Straits, the Seals diminish in species and numbers as they approach the Equator. It is also noticeable that the Eared Seals are not found in the Atlantic north of the Cape of Good Hope; nor are there any Pinnipeds in the North Indian Ocean.

I will now give a few extracts from Mr. Allen's work on the life-histories and manner of hunting some of these animals, beginning with the *Otariidæ*. The most interesting account, perhaps, is derived from the culture of the Northern Fur Seal, *Callorhinus*, by the United States on the Prybilov Islands,—two small islands near Behring Straits, which they received with Alaska territory from Russia. These islands were leased to the Alaska Commercial Company, with the right to take 100,000 skins annually, and of course it became a matter of pecuniary importance to take these in their best season and value, so as to keep up the stock on the island. The number of Fur Seals present on St. Paul's Island, as estimated by Mr. Elliot in 1872, was three millions, and on St. George's 163,000.

A party of natives live on the islands to attend to the interests of the Company, and collect the skins. At first, when indiscriminate slaughter was allowed, the yearly take was reduced to 7000 or 8000 in 1882; but by preserving them, and driving away the "Sea Lions" so as to give more room, they have increased in numbers, so that it was calculated there were over 4,700,000 on the islands; and Mr. Elliot conjectures that this is as many as that breeding station will hold.

St. Paul's, which is the largest island, has a coast line of 42 miles, of which 16½ miles of sandy beach are occupied by the Seals. To these beaches the old males begin to resort about the middle of May, when, till about the middle of June, there is a continual accession to their numbers, each on its arrival taking the best position closest to the water which it can. By the 12th of June all the best positions have been appropriated and fought for by the strongest males, who are, as a rule, never under six years of age. These stations are about ten to twelve feet square, and are jealously guarded. Those who cannot keep or get in the front rank take the next, and so on till the whole beach is full to a depth of five or six rows, and each "bull," after occupying a position, never leaves it an instant till the end of the season in August, being thus three months without food, and undergoing the most arduous exertion in maintaining his position.

Some of these "bulls" show wonderful strength and courage. Mr. Elliot remarked one veteran on the water-line, where at least fifty or sixty battles were victoriously fought by him. The fighting is mostly done with the mouth, opponents seizing each other with the mouth, clenching the jaws, each bite leaving an ugly wound, shredding the skin into ribbons.

About the middle of June the females begin to arrive, and are received by the males with much attention; but no sooner is wife No. 1 fairly installed in the home of her master than he sees another about to land whom he immediately approaches to escort, and, whilst so engaged, the male on the station next above his reaches out his great neck and abstracts wife No. 1 to be placed in his own pen; and this process is repeated until the whole of the pens are supplied, averaging to twelve each. The cows have one "pup" within a few days of landing, so that family life on the beach is tolerably stirring. By the 8th or 10th of August the pups born nearest the water begin to swim, and by the 9th of September the colonies are broken up.

It will be noticed that only males of six years old and upwards are able to keep their ground as beach-masters, and the younger males range in large squads in the sea and on the beach, and from these bachelor squadrons are taken those which furnish the required 100,000 skins. It is found that the young four-year-old male furnishes the best skin, and the natives select by careful management droves of these, and drive them further inland, where they kill and skin them.

A small colony of "Sea Lions" is preserved on the islands for the subsistence of the natives, who find its flesh more palatable and its skin more useful than that of the Fur Seal.

All writers agree in describing the very playful character of the young, and many intelligent traits might be mentioned. One hunter had his rifle in hand levelled at the head of an old "Sea Lion" which was roaring and barking at him from the water, and had his finger in the act of pulling the trigger, when a cub swam up to the irascible parent and put up his nose for a kiss, which was immediately bestowed. This had such an effect on the sealer's heart, he not having seen his own family for some time, that his gun was lowered and the beast allowed to go in safety. Another observer coming suddenly upon the nursing of some "Sea Lionesses," said that they looked at him with so intelligent, so distressed, and yet so lady-like an air, that he retired with the sense of having committed an impropriety.

The Walruses (whether two or one species) may be considered as now nearly confined to the Arctic Ocean, though at one time they came much further south. In 1534 they occurred as far south as Cape Sable in Nova Scotia, exemplifying the rapidity with which Pinnipeds are exterminated on their breeding-grounds. In the sixteenth and seventeenth centuries great numbers were killed in the Gulf of St. Lawrence. They are now found in Western American waters, south of Davis' Straits, and the north part of Hudson's Bay. East of Greenland they are still met with on the N.E. coasts of Spitzbergen and the eastern shores of Nova Zembla in considerable numbers. In the Pacific they occur on the American and Asiatic coasts as far south as the Aleutian Islands, and in numbers (according to a late writer in the 'Century') in Bristol Bay and Norton Sound.

The chase of the Walrus has been so often and so popularly described that I need not dwell upon it. In one respect this animal differs remarkably in its domestic economy from its congeners. The young is suckled by its mother until nearly three years old; for, living upon mollusca principally, it cannot get its own living until its tusks have grown a certain length, to enable it to dig for them itself.

Besides a great number caught locally by the native Esquimaux in America, and Tchuckchees and other tribes inhabiting the north shores of Europe and Asia, there are two large Seal "fisheries" carried on in the North Atlantic; one, a small area about 200 miles N.E. from Jan Mayen's Island (about the middle of April), where annually some 200,000 are killed. The majority of these are young Greenland Seals. Their rapid increase in size is remarkable; at birth their weight is 6 or 8 ℔.; they are suckled for fifteen or eighteen days, in which time they increase to from 55 to 60 ℔., of which the skin and fat—alone the object of pursuit—is about 40 or 45 ℔. It is at this age that the sealers prefer to take them, as they are then left by their mothers to shift for themselves, and consequently for some time they deteriorate in condition.

Another great breeding station is on the loose ice off the coast of Newfoundland, where the season begins about the middle of March, and lasts for two months. About 500,000 are annually taken here.

In the Pacific, South Atlantic, and South Indian Oceans the only true Seal that has been found in sufficient numbers to form a regular "fishery" is the Sea Elephant. This immense beast is described by the first observers, Peron, Anson, Pernety, and others as from 25 to 30 ft. in length, with a circumference of 16 to 18 ft. Modern observers do not find them of this size; but as two authentic skeletons measured 16 ft., which would make the animal when in the flesh about 22 or 23 ft. long, it is probable that the systematic hunting to which they have been subjected, does not allow them to attain their full growth. This species was formerly found by Peron in large numbers on the Falkland Islands, where it is now extinct, and along the west coast of Patagonia. It was also taken in large numbers off the coast of Mexico and Lower California. Mr. Allen thinks this a distinct species; it is said to occur still in small numbers at St. Barbara and Cerros Islands, in this locality. In the South Indian Ocean, the Crozets, Kerguelen and Heard Islands used to be regular stations for these Seals; but they are probably only to be found in any great numbers now on Heard Islands. In

Kerguelen Island they would long ago have become extinct, but for one inaccessible beach, "where they still haul up every spring (October, November); the beach is limited at each end by precipitous cliffs, across which it is quite impossible to transport oil in casks; nor can boats land from the sea, or vessels lie at anchor in the offing, as the beach is on the windward side exposed to the full violence of wind and waves." So that here, at all events, there is some hope of the species being preserved.

I possess an interesting account of these Seals, with a narrative of four years spent on the Crozets, after shipwreck there by a sealer named Goodridge. One habit is generally noticed of this species, although it is common to the group, which is to swallow large quantities of stones. Sealers and sailors usually attribute the function of this action to its use as ballast; some naturalists seem not disposed to allow this, and attribute it to a digestive craving. The point may be one for discussion; I rather incline to the sailors' theory, for the reason that fishes seem to require some means of altering their gravity, which is furnished by an air-bladder, and as Seals have not this arrangement, the taking in stones as ballast would seem to fulfil the need very well.

Now I think that the facts of distribution, &c., recapitulated all point to Behring Straits as the centre of distribution of Seal-life. Here, and here only, the three large groups meet. Here are Walruses, Eared and Earless Seals. From here we may suppose the Walrus and Earless Seals spread over the Arctic Circle into the Atlantic Ocean, one species, at any rate, reaching as far as the Mediterranean. From here the Eared Seals, accompanied by ear-less species, spread all down the Pacific coasts of America, doubling Cape Horn, and creeping up the South Atlantic shores of South America, perhaps to the Gulf of Mexico; another stream, following the Antarctic ice, reached up to the Cape of Good Hope and some of the islands in the South Indian Ocean; but we do not find that any reached the eastern coast of Africa, the coasts of India, or the Malay Peninsula. Another stream seems to have migrated from Behring Straits down the Japan Archipelago and part of the N.E. coasts of China. Whether it was this stream which supplied the Seals of the South Pacific, Australia, and New Zealand, or the one from round Cape Horn, remains to be settled by reference to the affinities of the different species.

How Seals came in the Caspian Sea and Lake Baikal are two distinct problems. That they exist in both is beyond doubt. On the Caspian is a regular "fishery," where some 100,000 are annually taken; and various trustworthy travellers and missionaries give details of the native "fishery" for Seals on Lake Baikal. As to Seals reported to exist in the Sea of Aral, or Lake Oron in Siberia, I can find no authentic account. The Caspian being below the general ocean-level, and the species being similar to Arctic species, points to some former connection between these oceans. Lake Baikal, however, is several thousand feet above the sea-level, the River Yenisei running down some 1200 miles from it into the Arctic Ocean. If Seals have ascended this distance from the coast, the case is unique; for nowhere else are they found much above the tidal part of a river. This case therefore remains a mystery.

Behring Sea is also the head-quarters of the Sea Otter, *Enhydris lutris*, which occurs from Behring Island down the N.W. coast of North America as far as Upper California. In many respects this animal forms a sufficiently good link between River Otters and Seals to emphasize the locality as the centre of distribution and evolution of the group of Pinnipeds. Its fur, the most costly of any, has more affinity to that of an Eared Seal than that of any other Otter. In size it approaches many Seals. Its feet are more webbed and its tail shorter than in River Otters; and, lastly, its pelagic habits make it a very good forerunner of *Otariidæ*. If we assume that one branch of the Otter family acquired pelagic habits and a beautiful fur, its exclusively piscine food gradually tending to the differentiation of its molars and premolars into a series of tridents,—whilst another branch of the family, preferring crustacea and mollusca, developed its hind teeth into sufficient shell-crackers, and, requiring more prehensile power in its paws to search for its prey under stones, &c., did not develop these so completely into fins as its congener,—the relative geographical distribution of the different species seems sufficiently plain.

ON THE BIRDS OF THE ISLE OF EIGG.

By A. H. Macpherson, B.A., and H. A. Macpherson, M.A.

Strangers who scan this island from the decks of the numerous steamers which ply between Oban and the Gairloch, usually offer a few speculations on the famous Scuir Rock, which like a couching lion crowns its southern summit. Their curiosity sometimes induces them to enquire the whereabouts of the Macdonald's cave; but here their enquiries cease, and they pursue their journey imagining that Eigg is a fine island, capable of pasturing many black-faced sheep, but certainly of no special interest to the public at large. Nor is this surprising, for it is only when the island has been traversed on foot in all directions, that the mind becomes sensible of the immense variety of physical beauties here massed together within a comparatively small area. North and south, sweeping precipices of igneous formation roll down to a low shingly beach, or drop sheer into deep water, in which Seals (*Phoca vitulina*) may often be seen.

Turning inland, we wander over long stretches of purple heather and meadows crowded with summer flowers; or visit the lochs where trout are leaping, far away from even shepherd's shieling.

Such conditions as these are eminently favourable to both muirfowl and seafowl, but at first sight there does not seem to be much cover for the smaller land birds. Fortunately, on the eastern exposure, the nakedness of the land in this respect is hidden by a luxuriant growth of mixed timber, which, though planted within recent years, has already assumed fair proportions.

This being the general appearance of the island, it only remains to say, before proceeding to describe its avifauna, that Eigg is separated by a narrow strait from Rum on the west, and is distant from Arisaig, on the opposite mainland, some ten miles; and secondly, that our information consists of personal observations, recorded in our note-books during various short summer visits to the island, chiefly during the last seven years.

Long protection has encouraged many species to haunt the grounds of the proprietor. On his gables we have heard the Song Thrush singing nightly; Blackbirds are attracted by ripening fruit in the kitchen-garden close by, and even the shy Ring Ouzel

(*T. torquatus*) leaves its haunts at Laig and Grulin, venturing in search of some more dainty morsel than the rocky grounds which it chiefly affects can afford.

Wheatears (*Saxicola œnanthe*) find secure nesting-quarters in deserted rabbit-holes, and are everywhere very numerous; many broods of young Whinchats (*Pratincola rubetra*) enliven the hay-fields early in July; while the Stonechat (*P. rubicola*) frequents heathered patches in the centre and west of the island, but only in limited numbers. Around the doors may be seen the mottled nestlings of the Redbreast (*Erithacus rubecula*), which has been known to rear its young inside the house; the nearest under-growth of weeds holds a few pairs of Whitethroats (*Sylvia cinerea*). The sharp cry of the Goldcrest (*Regulus cristatus*) among the larches, recalls more than one dainty suspended nest; while family parties of the Willow Wren (*Phylloscopus trochilus*) may be seen exploring the remotest coppices in the island, never relaxing their vigilant search for the *Aphides* which form a large portion of their subsistence.

Beside a running brook are located one or two couples of Sedge Warblers (*Acrocephalus phragmitis*), a species detected here first in 1888 by A. H. M. Near here a pair or two of unobtrusive Hedge Sparrows may be noticed prying for insects among the fallen leaves; and a short ramble thence conducts us to a burn, often frequented by the Dipper (*Cinclus aquaticus*). The fir plantations re-echo the sibilant cry of the Coal Tit (*Parus ater*), but are less attractive to the Blue Tit (*P. cæruleus*), than sycamores and the other smaller trees. The Wren (*Troglodytes parvulus*) is quite as much at home in the loose crumbling dykes as on heathery knolls and the mossy ledges of the rocks. The Pied Wagtail (*Motacilla lugubris*) is a scarce bird in Eigg, though it is far more plentiful than the Grey Wagtail (*M. melanope*), a species only observed once, in August, 1887.

As early as May 22nd, we have found young Meadow Pipits (*Anthus pratensis*) in the nest; along the shore this species is replaced by the Rock Pipit (*A. obscurus*), of which the nestlings are rare adepts in catching midges. A good many Spotted Flycatchers (*Muscicapa grisola*) ply their calling on the skirts of the plantations, all the more usefully since the Swallow (*Hirundo rustica*) only occurs as a passing straggler. Some doubt was once expressed as to the existence of the House Sparrow, but in 1885, we discovered a flourishing colony in certain ivy-covered rocks near the farm of Kiel. This colony is increasing, and a second now occupies the farmsteadings at Laig (1888). Unfortunately, no such increase can be reported of the small establishment of Tree Sparrows (*Passer montanus*),—discovered in 1884 by Mr. W. Evans as tenanting the ruins of St. Donnan's shrine,—though watched assiduously from year to year. Nevertheless it appears to be double-brooded; we have both examined very young nestlings in mid-July. Here, as elsewhere, we have enjoyed the low, sweet song of the males, which we suspect may sometimes interpair with the House Sparrow, having observed them together in the nesting-season. The seeds of dockweed are eagerly devoured by this species.

Our earliest date for the fledged young of the Chaffinch is May 25th; in 1886 a bachelor of this species frequented the garden-lawn all summer, leading an idle life in contrast with the energetic labours of paired couples.

In August, 1887, we met with three examples of the Linnet (*Linota cannabina*) for the first time, and in 1888 detected the Lesser Redpoll (*L. rufescens*) among the young timber. The Twite (*L. flavirostris*) is numerous on the moors, and we have occasionally seen it feeding on ripening heads of dandelion.

On July 3rd (as already announced, p. 349), our plantations received a visit from a large flight of Crossbills (*Loxia curvirostra*), which first attracted attention by curvetting like a flock of Starlings before our windows. They allowed us to approach closely and observe them through binoculars; the majority were in female dress, unaccompanied, so far as could be ascertained, by the dark striations that characterise the nest-feathers; only one or two wore red plumage.

The birds, when first approached, proved to be feeding on a species of aphis affecting the under surface of the leaves of the elm, and this food was procured by a method which we had not previously observed. Applying both rami of the scissor-like mandibles to sever the stem of an affected leaf, the Crossbill would fly to a bare branch, and holding the divided leaf between the toes of the left foot, proceeded to scoop up "seriatim" the aphides, securing them with the fine points of the bill, assisted by the tongue; a leaf was no sooner cleared than dropped at our feet. Some apprehension was awakened between 3 and 4 p.m., by the fact that several parties of Crossbills deliberately left the island, on which they had probably arrived during the morning hours; these squads of birds flew high, and departed with a N.E. wind, apparently shaping their course across the sea to strike the mainland, a point or two north of Ardnamurchan. However, a few birds lingered, and at the end of the month came under the notice of A. H. M., who observed them feeding on larch cones, and described their call-note as "trutt—trutt."

A Corn Bunting (*Emberiza miliaria*) was noticed on July 29th, 1888, with a malformation of both mandibles, possibly induced by old age.

About our doors Yellow Buntings (*E. citrinella*) may always be seen, never failing to bring their young ones to share in the bread crumbs daily thrown out for them. A few mossy spots tempt the Reed Bunting (*E. schœniclus*) to breed in Eigg, though in limited numbers; nor does the Starling increase and multiply as rapidly here as in some other parts of the Hebrides. The sweeping precipices that on the west side overhang Cleadale, were formerly the home of a few Choughs (*Pyrrhocorax graculus*), now exterminated, probably by the Peregrine Falcons. A single Chough was observed at Laig, in August, 1876, by Mr. W. H. Macpherson; and John Macleod, a native of the island, possessed a tame bird about the same time. Would that the same evil fortune had accrued to the Hooded Crows (*Corvus cornix*)! Usually the Hoodies are content to nest in the sea-cliffs, but a pair lived this year in the plantations, and a second couple obtained the rights of sanctuary by nesting in the garden of the manse. In 1885, a few Rooks (*C. frugilegus*) built in the plantations; and though their design of becoming permanent settlers was speedily checked, yet they constantly infest the island during August, some scouring for food, and others roosting in the plantation, whence they return to the mainland at daybreak. Though we dislike these arrant and vulgar poachers, we desire to encourage and protect the unjustly disparaged Ravens (*Corvus corax*). Three couples of these birds reared their dusky broods at the north and south extremities of Eigg this year. The Skylark nests in the short heather, but in small numbers; nevertheless, daybreak is everywhere enlivened by the Cuckoo, especially on the west side of Scuir. Though pellets of Owls occur in the fir-woods, the only Owl that both of us have seen repeatedly is the Barn

Owl, nesting among the rocks in the centre and west of the island.

Thirty years have passed since a thoughtful individual introduced rabbits into Eigg, and they have multiplied at so great a pace, that they have proved a valuable consideration to the fine pair of Buzzards (*Buteo vulgaris*), which utter their melancholy cry beside the overhanging cliff where their young are reared. We have picked up their cast feathers as they circled over the sea, occasionally troubled by the Herring Gulls which love to buffet their formidable neighbours.

Whether the Golden Eagle has ever bred in Eigg is more than doubtful, but from time to time the island receives a visit from one of those that nest in Rum. When Mr. W. Macpherson visited friends in Rum in 1833, he was playfully rallied on the visits paid by "Dr. Macpherson's Eigg Eagles" to the flocks in the sister island. At that time, at least three eyries in Eigg were tenanted by the White-tailed Eagle, and a pair nested there until 1879, when they were driven away by the malevolence of an English gentleman. A report that Eagles nested in Eigg in 1887 appears to be ill-grounded. A female of this species which attracted the admiration of our friend the late Mr. R. Gray, was killed in the island some years ago, in consequence of its continued depredations on young lambs. It proved to have lost three toes in a trap, and was not an Eigg bird, but a visitor from some other quarter. The Sparrowhawk occurs as a straggler from the mainland; the Peregrine rears its young in safety in most seasons, but this year we were pained by the apparent absence of both old and young birds. The value of the Kestrel in checking the increase of the Short-tailed Fieldmouse (*Arvicola agrestis*) can hardly be exaggerated. Fortunately a good many pairs breed, and we have had both live Kestrels and Buzzards brought to us as pets.

The Hebrides offer a scanty subsistence to Wood Pigeons (*Columba palumbus*), but a few pairs nest in the island almost every year; even the hardy Rock Dove (*C. livia*) is pinched in winter; four of the Eigg caves are inhabited by these birds. The introduction of the Partridge has succeeded, and a few coveys are bred annually on the east side; but the Hooded Crows have proved very detrimental to the increase of Grouse. In the winter of 1878-9, some Water Rails frequented a wet bottom, and one of them was shot by Mr. Scott. Their relative, the Corn Crake, serenades our summer nights, and a pair or two of Moorhens frequent a moss near Laig. Golden Plover breed sparingly in the hills, and the eggs of the Ringed Plover may be found on the sands at Laig or near Kiel; the number of resident birds being increased by autumnal visitors. A few pairs of Lapwings breed on Castle Island and behind Kiel farm, and have done so for some years. The Oystercatcher nests at several places along the coast; an abundance of fresh springs invites large flights of Woodcock; the Snipe may be heard "bleating" on the same mosses in early spring. Dunlins (*Tringa variabilis*) appear in small numbers in August, even before the hordes of Common Sandpipers (*Tringoides hypoleucus*) take their departure south. It is not unusual to see a few Redshanks (*Totanus calidris*) tripping over exposed reefs at low tide, and Curlews (*Numenius arquata*) are sometimes to be seen in large flocks; neither species is known to nest in Eigg, though present all the summer. It is only in spring that the Whimbrel (*N. phæopus*) lingers on our shores. Some needless doubts as to the presence of the Cormorant (*Phalacrocorax carbo*) have found their way into print; but it is only present in small numbers, nor have we seen more than single birds. The Shag (*P. graculus*), of course, musters strongly, breeding in a cave at the south end of the island, and occasionally travelling out to the deep waters, fished by fleets of snowy Gannets (*Sula bassana*). As a visitor, the Heron (*Ardea cinerea*) exacts heavy black mail from the burn trout; in 1882, the eggs of this bird were taken in the west side of Eigg.

Though the rocky shores of Eigg are ill suited to meet the requirements of the estuary-loving Sheldrake (*Tadorna cornuta*), yet stragglers visit the bays on both sides of the island, and one or two pairs nest on the east side. The lochs on Scuir have owned many pairs of Mallard (*Anas boschas*) to our own knowledge since 1870. Quite recently the Eider (*Somateria mollissima*) has frequented the Castle Island and reared one or two broods, enabling us to enjoy the spectacle of a little file of youngsters paddling pluckily after their mother in a considerable swell. The haunts of the Eider are in this case well suited to the Merganser (*Mergus serrator*); yet we have searched in vain for its nest, and have only met with single and unpaired birds.

The shallows of the coast are often visited by Arctic Terns (*Sterna macrura*), and less frequently by some Common Terns (*S. fluviatilis*), but neither species has nested there. Although eggs of the Kittiwake (*Rissa tridactyla*) were obtained on the east side some eighteen years since, we cannot positively state that it now breeds with us; it is certainly numerous all summer. Numbers of Herring Gulls (*Larus argentatus*) nest at Grulin, and the Lesser Blackbacked (*L. fuscus*) and Common Gulls (*L. canus*), are also very common. The Great Blackbacked Gull (*L. marinus*) breeds at Grulin and on the lochs at Scuir in some seasons. In August it is not unusual to see a few Blackheaded Gulls (*L. ridibundus*), chiefly immature birds. We have not observed any of the *Stercorariinæ*, nor have we obtained any Petrels, though the late Mr. R. Gray received an example of *Thalassidroma leachii* from Eigg. Passing over the Manx Shearwater (*Puffinus anglorum*) which has been recently dealt with at some length (p. 372), the Divers that frequent our shores are chiefly *Alcidæ*. Small parties of Razorbills (*Alca torda*) and Guillemots (*Uria troile*) fish in the sound; cream coloured varieties of the latter occur. Black Guillemots (*Uria grylle*) nest in the rocks below Grulin; it is interesting to watch them feeding their young. There is no nesting-place of the Puffin (*Fratercula arctica*) in Eigg, but its presence on the coast in summer is a fact of daily observation.

Having thus enumerated the species which have come under our notice, it may be well to state the census of the avifauna.

In 1885, our friend Mr. W. Evans published a list of the birds of Eigg, compiled from his own journal and other sources of information (Pro. R. Phy. S. Edin. viii. pp. 430—448); this list included 82 species. Of these, in our opinion, five must be rejected, as included on insufficient evidence, *viz.*, Bullfinch, Short-eared Owl, Sclavonian Grebe (?), Greater Shearwater, and Storm Petrel, leaving a total of 77 species. Of these 77 species, five have never occurred to us, *viz.*, the Long-tailed Tit, Swift, Nightjar, Jack Snipe, and Great Northern Diver; nor do we regard them as regular visitors to the island. Our own notes comprehend 85 species, and a grand total of 90 species is thus arrived at. Of these, at least 58 nest in Eigg. While, therefore, this list is confessedly incomplete, it is based on a fair knowledge of the island, and will no doubt be added to from time to time. There can be no doubt that the Wigeon, Teal, Goldeneye, and probably the Greylag Goose, Glaucous Gull, and other species occasionally visit Eigg in winter, but it is to be regretted that no professed ornithologist has hitherto spent a winter in this island.

It only remains to explain, that while we have avoided presenting these notes in the form of a catalogue, the arrangement of 'The Ibis' list has been followed. All the species here recorded from Eigg have occurred in the adjoining island of Skye.

NOTES ON THE OCCURRENCE OF PALLAS'S SAND GROUSE IN LINCOLNSHIRE.

By John Cordeaux.

The first part of these notes has reference to the occurrence of the Sand Grouse in Lincolnshire in 1863, and is corrected and enlarged from the notice of this species published in the 'Birds of the Humber District' in 1872. The second portion (1888) is taken from my note-book for the current year.

1863.

A flock numbering from forty to fifty was seen in the parish of Saltfleet-by-all-Saints about the latter part of April or early in May, 1863, and they remained about the sand-dunes on the coast till July, after which date they disappeared. Of these, twenty-two were shot by Mr. William Larder, of that place, and a pair by Mr. Stubbs, since dead. Some of Larder's birds were sent for preservation to Mr. Kew, of Louth, by the Rev. E. Freshney, then residing at Skidbrooke. Mr. Clayton, also a birdstuffer of Louth at that time, personally informed me that in that year seven or eight pairs passed through his hands; some others of these birds, their rarity and value not having been recognised, appear to have been sold for food. About the same time, also, several Sand Grouse, whose history cannot now be traced, were brought to Louth by the marsh carriers, and sold to the game-shops, or otherwise privately disposed of.

In a letter which appeared in 'The Field' of July 9th, 1888, the Rev. J. E. Wallis Loft states, on the authority of Mr. Kew, taxidermist, of Louth, that the Sand Grouse were sent to him by

Mr. Freshney in the summer of 1864. I have been at considerable trouble to get at the facts, and have no hesitation in saying this is, in all probability, an error. Larder's birds were shot in 1863, and not in 1864 as stated, and the evidence in my possession seems conclusive on this point.

In the second week in May, one which I saw in the flesh was picked up dead in the parish of Little Cotes, near Grimsby. Prof. Newton ('Ibis,' vol. vi. p. 205) states that, out of a flock of thirteen, a male and female were shot on May 25th, at Leake, in South Lincolnshire. Two were shot by Mr. Francis Cooke, of Huttoft, near Alford, on the 7th or 14th of August, 1863, out of a flock of about twenty flying with great speed from the eastward over his head, when lying on the sand-hills near the coast. It is possible these may have been the remainder of the large flock—known to have been reduced to about that number—seen at Saltfleet-by-all-Saints up to July, Huttoft, also a coast parish, being about ten miles south of that place.

1888.

May 18th.*—A flock of ten or twelve in a grass-field on the wold, in the parish of Irby, six miles S.W. of Grimsby; these were first observed by a boy called Grimoldby, who was tenting birds; charging his gun with shot, he succeeded in killing three, and wounded a fourth, subsequently picked up. Three of these were eaten, the fourth (an adult male) came into my possession. The boy described them as running not unlike partridges, but with a rolling sort of gait.

May 22nd.—Four seen on Swallow Wold, and one shot: stated on the authority of the Rev. J. E. Wallis Loft, the Rector of that parish.

May 23rd.—One shot, from five, at Epworth, Isle of Axholme, and recorded in 'The Field' of June 2nd, by Mr. S. Hudson.

May 25th.—A pair reported as seen on Tetney foreshore by one of Mr. G. H. Caton Haigh's keepers.

May 28th.—Two, a male and female, shot by Mr. C. Robson in the parish of Cawkwell, near Louth, and now in the collection of Mr. J. Topham, of Wooton Grange.

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* Sand Grouse are reported to have arrived at the Spurn and Flamborough Head at the same date, also in Oxfordshire and Herts.

A flock of twenty-six at Tetney Lock, about the end of May, seen by the son of Mr. Stubbs, a well-known wildfowl shooter, living near that place.

June 2nd.—One, a female, killed on the Bourne and Spalding Railway, and taken to Mr. Evans, of Bourne. Five seen in a field between Lincoln and Reepham by my friend Mr. Jacob Marshall, who was travelling by rail at the time. One shot by Mr. Longstaff, of High Toynton, near Horncastle, and recorded by the Rev. J. E. Wallis Loft. Eight found dead in a field at Fulstow, a coast parish, and identified by Mr. G. H. Caton Haigh: they are supposed to have been killed by eating poisoned barley, of which their crops were full. These birds were so far decayed that two only could be skinned and preserved.

June 4th.—One seen on Cabourn Wold, and recorded by Mr. Loft in 'The Field' of June 9th.

June 9th.—One, as I am informed by Mr. J. Eardley Mason, of Alford, was shot from a flock of twenty to thirty at Asserby, in the parish of Bilsby. They had been observed to frequent a barley-field for two or three days previously.

June 14th.—Twenty-one on the wold at Horkstow, near Barton-on-the-Humber. My informant, Mr. J. E. Turton, says, "In their flight, which was from N.W. to S.E., they strongly resembled Golden Plover, only they seemed reddish-brown birds with long tails, and they had a peculiar clucking note, which I heard before they appeared and after they were out of sight."

June 15th.—A small flock of seven seen by Mr. Beulah, of Raventhorpe, in the Forest-field, adjoining Bromby Common. On the 17th, in the same place, five and nine, and on the 20th two, a seven and a five—obviously the same as were seen on the 17th. The field is one of fifty-five acres, very quiet and retired; half was sown with turnips. Mr. Beulah says, "I first saw them on the sandy soil running like partridges, but when they rose I noticed their long, pointed wings and grouse-like flight." They were last seen in the neighbourhood on July 9th.

June 18th.—About this date two flocks of eight and twelve on Humberstone fitties, lingering about the neighbourhood to the end of the month; two were shot.

A flock of fifteen, seen by Stubbs, about the end of June, near Tetney.

July 8th.—Mr. J. Eardley Mason writes that Mr. Spencer

Robinson, of Authorpe, near Alford, reported several small parties of Sand Grouse about that parish; they fed undisturbed, and seemed likely to stay.

July 20th.—Two received by Mr. Evans, of Bourne, shot in the parish of Holbeach.

July 28th.—A pair, also from the same parish, sent to Mr. Evans for preservation.

August.—About the middle of the month, five were seen on the wold by Mr. J. Sowerby, of Cuxwold Hall.

August 30th.—Two, as Mr. Haigh informs me, were shot from a flock of about forty, at Mablethorpe, on the coast, and purchased by Mr. Kew, of Louth.

September 13th.—Twenty seen together near the coast at North Cotes, by the son of Mr. Stubbs, the wildfowl shooter, and mistaken at the time for Dotterel. Mr. Haigh says the lad seems to have been particularly struck with the dark markings on the under parts, and recognised the call as the same as that of the birds he had seen in May.

October 3rd.—Mr. Haigh informs me that a small flock of five were seen by Stubbs, who was engaged in plover-netting; they flew across the "fitties" near Tetney Lock, coming from the direction of the Spurn, and, crossing the sea-bank, went inland.

October 10th.—One, a female, which I saw in the flesh, was shot at Summercotes. The feet and tarsi were much coated with clay, and the tail-feathers and primaries soiled and draggled; so that I question if the bird would have been equal to re-crossing the North Sea, although otherwise it was plump and in fair condition. The gizzard contained a grain or two of wheat and some vegetable-fibre, and an unusual quantity of small quartz-stones, exactly similar to those which I had taken from the stomachs of Sand Grouse on their arrival in May. Another from the same locality was sent to Mr. Kew, of Louth, about the same date. On the 10th also, Mr. Haigh saw six in a barley-stubble at North Cotes; they would not permit him to get nearer than seventy yards, when they rose and crossed the sea-bank.

When dealing with such restless wanderers as the Sand Grouse, which are here one day and may be gone the next,—able to pass in a single flight across the length and breadth of the country,—it is impossible to give more than an approximate estimate of their number.

Exclusive of the flocks seen near the coast late in August and in September and October, which may probably be referred to birds coming from the interior, and approaching the sea before taking their departure, the number actually recorded as visiting Lincolnshire is, as far as I am able to ascertain, about one hundred and eighty-four. Making a liberal allowance for flocks seen more than once, we may certainly estimate the number as considerably exceeding one hundred. I am strongly inclined to think that, taking the dates as they occur, the number in each flock, and the localities in which the birds have been seen, I am justified in placing the actual amount at about one hundred and forty to fifty between May 18th and July 28th. The number killed being twenty-five, of which sixteen were shot, eight died of poisoned grain, and one was killed on the railway.

It will be seen by reference to the notes that there are indications of a second and very considerable arrival of Sand Grouse about the middle of June, either the result of birds changing their locality, or perhaps a fresh arrival from the Continent. In 'The Naturalist' for July, 1888, Mr. Matthew Bailey records several flocks of Sand Grouse as appearing at Flamborough between the 15th and 18th of June; and in one of the Migration Schedules recently received from Mr. John Odgers, of the High Light, Whitby, are the entries:—"June 16th. Four Sand Grouse, 2 p.m., calm, o. c. p.m., in field close to lighthouse. June 17th. Three Sand Grouse, 10 a.m., N.W., close to lighthouse."

I have no information to lead to the conclusion that any Sand Grouse have nested, or attempted to nest, anywhere in this county.

[A Report on Pallas's Sand Grouse in the North-West of England has recently been published by Mr. H. A. Macpherson in the 'Transactions of the Cumberland and Westmoreland Association for the Advancement of Literature and Science' (No. XIII., 1888, pp. 59—75); and we are glad to announce the promise of a similar Report from Norfolk by Mr. Thomas Southwell, which we hope to publish in our next.—Ed.]

NOTES AND QUERIES.

The Fauna of the Outer Hebrides.—We are glad to hear that Messrs. J. A. Harvie Brown and T. E. Buckley have in preparation a work on the Vertebrate Fauna of the Outer Hebrides. It will form a companion volume to their lately published work on the Vertebrate Fauna of Sutherland, Caithness, and West Cromarty, and will be illustrated by views of scenery, and maps of the main range and outlying islands, with sea views of the same vignetted upon the maps. It is announced as shortly to be published by Mr. David Douglas, Edinburgh.

MAMMALIA.

The Distribution of Natterer's Bat in Great Britain.—It is proposed to publish at an early date an article on Natterer's Bat, in continuation of the series on British Chiroptera, in which several species have been already dealt with. An excellent drawing from life has been furnished by Mr. G. E. Lodge; and the Editor would be glad to receive notes of the occurrence of this bat from any hitherto unrecorded localities, and any observations on its habits, if peculiar.

A new Australian Mammal.—A small mole-like animal, which appears to be new to science, has been forwarded by Mr. A. Molineux, of Adelaide, to the South Australian Museum. It was found on the Idracowie Castle Station, at a distance of about 100 miles from the Charlotte Waters Telegraph Station, on the overland line from Adelaide to Port Darwin; but the circumstances of its capture are not yet to hand. The collector, however, reports that it must be of rare occurrence, as on questioning the aboriginals of the locality, there was only one old woman who said she had seen it before, and that upon a single occasion. Mr. E. C. Stirling, of Adelaide, who communicates the discovery to our contemporary 'Nature,' states that it is evidently an underground burrowing animal, resembling the Cape Mole (*Chrysochloris*) in its general external appearance, but differing in many respects. The total length is 13 cm. inclusive of the tail, which is 2 cm. long. The head, relatively shorter than *Chrysochloris*, has a rounded muzzle, the dorsal surface of which is covered by a horny shield. Nostrils transversely slit-like. No eyes visible, the skin passing uninterruptedly over the ocular region; but on reflecting the skin on one side of the face, a small circular pigment spot is visible in the position of the eye. No apparent bony orbit. Tongue fleshy, broad at the base, and tapering to a blunt point. No external ears; but the ear-openings distinct, 1 mm. wide, and covered over with fur. The fore limbs are short, resembling somewhat those of a Mole; but the manus is folded, so that the large nails of the fourth and fifth digits only are visible in the natural position of the limbs. The hind limbs are also short, with the soles turned outwards. The tail 2 cm. long and 5 mm. wide at the insertion tapers to 3 mm. and terminates in a knob-like tip. About 15 mm. in front of the vent, there is a pouch in the integument about 4 mm. wide, with the opening directed backwards and having a depth in a forward direction of from 4—5 mm. The surface of this pouch is devoid of hair, but the bare area is surrounded by thick fawn-coloured fur, with a slightly reddish tint; it is possible, however, that this reddish tint is due wholly or in part to some ferruginous-looking sand, which is much mixed up with the fur. The body generally, with the exception of the lower two-thirds of the tail, which is bare, is covered with fur of a rather lighter tint. The intestines had unfortunately been removed, but in a small part of the lower bowel which was left, the remains of ants were found. With regard to the lower jaw and the general characters of the teeth, Mr. Stirling was struck with their resemblance to these parts (as figured in various osteological works) of *Amphitherium*.

BIRDS.

Pallas's Sand Grouse in Norway.—An example of Pallas's Sand Grouse was obtained at Röraas, Norway (in lat. 62° 36′ N.), in April of this year. It is now preserved in one of the stations on the Throndhjem-Hamar Railway. The station-master expressed himself as sure of the month, but his answer to my further question, as to whether there had been more than this one individual, was lost in the noise of the train as it moved out of the station. I could easily write and ask for further particulars, if this should chance to be the most northerly record of this species in this year's visitation, or if it is of special interest on any other account.—Alfred H. Cocks (Great Marlow, Bucks).

Tree Sparrow breeding in Middlesex.—In 'The Zoologist' for September last (p. 355), Mr. Barrett-Hamilton pointed out the omission of Middlesex from the counties in which, according to Yarrell, it has been found breeding, and after expressing his doubt whether it has since been recorded from Middlesex, concluded by stating that it breeds annually near Harrow. An editorial note appended to this communication was intended to refer to a previous volume (Zool. 1877, p. 24), in which the Editor had commented upon the same passage in "Yarrell," and recorded the nesting of the Tree Sparrow at Hampstead. By an unfortunate printer's error, however, the reference was given as "Zoologist, 1887, p. 24" (instead of ten years earlier), and so the whole point was lost. Mr. Barrett-Hamilton, and perhaps others, may be glad to have the correct reference.

Pied Flycatcher in Ireland.—The rarity of *Muscicapa atricapilla* in Ireland has already been noticed (pp. 267, 391). On October 4th I received from Mr. George Dunleany, light-keeper on the Fastnet Rock, Co. Cork, a Pied Flycatcher, in the flesh, found dead on the rock on Sept. 30th. From Mr. P. Corish, Tuskar Rock Lighthouse, Co. Wexford, I have just received (October 16th) the remains of another of these birds, procured Sept. 28th, making the fifth Irish specimen recorded.—Richard M. Barrington (Fassaroe, Bray, Co. Wicklow).

Velvet Scoter at Exmouth.—My friend Mr. P. Brutton, of Exmouth has recently presented me with a specimen of the Velvet Scoter, *Œdemia fusca*, a very rare bird in that neighbourhood; and what is more rare in the case (it being so purely an oceanic duck), it was shot in the estuary of the Exe, some three or four miles up from the sea, nearly opposite Lympstone. Possibly this may be worth recording.—W. Taylor (10, Chad Road, Edgbaston).

Manx Shearwater in Skye.—My friend Mr. F. W. Johnson has recently made the interesting discovery that the Manx Shearwater nests on the Skye coast. In proof of this, he was kind enough to send me a fine nestling last August. This is no surprise, for as long ago as in 1882 I expressed, in 'The Zoologist,' my impression that colonies of the Shearwater would be found on the Skye coast; and this has been confirmed by my more recent notes, and by those of Mr. Harvie Brown and Mr. Johnson. I have only, however, once visited the locality which Mr. Johnson kindly undertook to search this year, and the Fulmar was then the object of our quest. It is, in fact, a lonely place, and no one but a local resident would be likely to discover it, so that the birds are safe from molestation. But the curious fact about it is that the Herring Gull nests on the same grassy ledges as the Shearwater—a fact entirely new to my experience. Doubtless some other fresh facts will come to light on further investigation, and I have no doubt that other colonies of Shearwaters exist on the coast of Skye, though possibly they are inaccessible, or nearly so.—H. A. Macpherson (Carlisle).

Habits of the Manx Shearwater.—I venture to trouble you with a few remarks on the above subject, in case others have not written to you in the same strain. While at Scilly this year I visited a breeding-colony of the Manx Shearwater. When drawn from their burrows in broad daylight these birds were at first quite unable to rise from the level ground, or even from a gentle slope. This I attributed to the sudden change from darkness to light; but Mr. Barrington's observations show that the supposition was, at any rate, only partially correct. Undoubtedly the Shearwaters' sight was much affected, for I observed that the nictitating membrane was frequently drawn over the eye, and even when I tossed two or three birds into the air they fell helplessly to the ground. After remaining a short time on the ground the Shearwaters took wing with difficulty, acquiring a sufficient impetus by half flying, half running. Out of the fourteen or fifteen birds I handled, one only attempted to peck my finger. A very slight pinch was the result, although I tried to stimulate its energy by teasing it with my finger. The other birds persistently refused to "bite." There were, however, no young to defend. The scent which pervades the Shearwater's burrow is, although faint, an almost unerring guide to an inhabited or recently-used hole. Ornithologists who carefully used their noses would seldom have to dig in vain. With regard to the food of the Manx Shearwater, the Rev. H. A. Macpherson's observations are surely not sufficiently precise to establish as a fact that it consists largely of surface-fish. If he actually saw the Shearwaters catching the fish on which he assumed that they and the Herring Gulls were feeding, of course the question would be set at rest. Neither does the substance, pronounced by Dr. Fletcher to be fish-muscle, seem to throw much light on the subject; for it may as possibly have been some scrap of floating offal as a portion of a fish caught alive by the bird. The absence of bones, which would probably be last digested, is also significant. The bill of the Manx Shearwater is slender and weak, so that if this bird does, as is likely enough, occasionally feed upon fish caught by itself, its prey is probably very small fry. One would suppose further that a bird so weakly armed for offence or defence as the Shearwater must stand a poor chance of getting more than hard knocks when feeding with such strong and greedy robbers as the larger Gulls.—C. R. Gawen (Chetwynd Park, Newport, Salop).

Habits of the Turtle Dove.—My brother's note (p. 389) has suggested to me that some further particulars of the Turtle Doves which he incidentally mentions may be acceptable to some of your readers. For the last few years of my father's life he was an invalid, and used to derive much amusement from watching and feeding the birds which frequented his garden. The graceful beauty of the Doves, and the fact that they alone of the summer migrants could be brought up close to the house by feeding, made them his special favourites. They were fed with turnip-seed and white peas, of which they seemed to be very fond, and doubtless the Wood Pigeons and Stock Doves, which remained with us all the winter, served as decoys for the Doves. These used to appear about the end of April, the earliest date being the 24th, and throughout the months of May and June they increased in number almost daily. The largest gathering of Doves of which I can find any record in my father's notes is fifty-four, counted on June 21st, 1886. In July and August the numbers rapidly diminished, and by the end of August hardly one could be seen. The old birds very rarely brought their young ones to be fed, but seemed rather to take them away to the fields. I should say that not one-sixth of the number which came to feed nested anywhere about the property. In 1884, a white Turtle Dove appeared once or twice with the others. I did not see this bird, so cannot express an opinion as to whether it was a variety of the wild species, or an escaped bird of the kind frequently kept in aviaries. Some birds, probably the older males, are very handsome and rich in colour, and a group of twenty or thirty busily engaged in feeding is a very pretty and interesting sight, especially when Wood Pigeons and Stock Doves join them. The effect produced by several birds "purring" at the same time is rather curious. They are still protected, and fed, and I have no doubt that on any fine afternoon in May or June next I could show a fairly large number to any lover of birds who may wish to see them.—Julian G. Tuck (Tostock Rectory, Bury St. Edmunds).

Food of Wild Ducks.—At the beginning of August last, when the shooting season commenced, a friend kindly sent me a couple of full-grown "flappers." When picked, I noticed how unusually distended the crop of each appeared to be, which, to the touch, was apparently filled with something coarse and rough, like small pieces of chip. Curiosity led me to open them, when I found the whole cavity completely crammed with cases of caddis-worms, some containing the larva and others empty, as if the birds in their eager feeding had indiscriminately swallowed the cases, whether containing worms or not. I am not versed enough in the Trichoptera to say to what species the cases were referable,—probably more than one,—but I was surprised at the quantity the birds had taken at a single meal, and when turned out, it did not seem possible that the two crops could have contained such a mass, especially when we consider the nature of the materials of which caddis-cases are built, for I should imagine that if the mass had been weighed, the smaller half only would have been digestible, even in the stomach of a duck, but I suppose the wild birds of this family resemble their tame relations in their voracity.—G. B. Corbin (Ringwood, Hants).

Notes from Dorsetshire.—During the past summer a pair of Curlews, *Numenius arquata*, bred on the heath-land near Sandford Bridge, Wareham, and another pair near the third milestone on the Wareham and Bere road. I saw the brood of the latter (three in number), with the old birds, on August 11th, nearly full-grown. Two Whimbrels, *N. phæopus*, were shot on the shore of the Poole Estuary on Sept. 16th; on the 24th I saw two others in company with seven Curlews. A pair of Redshanks nested and brought up four young ones, in June last, at Arne. The garrulity of the parents endangered their safety, but owing to the loneliness of the district they escaped. A pair of Dippers, *Cinclus aquaticus*, bred on the banks of the Frome, between Stoke and Bindon Abbey under a wooden bridge. This is its first recorded occurrence on the eastern side of the county. Three Knots, a Pochard, three Pintails, and two Grey Plover were shot by a Poole gunner on Sept. 8th.

I had the pleasure of seeing a pair of Choughs at Lulworth, and a Dartford Warbler near Wool on Sept. 20th. Both are nearly extinct in this county; I trust these survivals may forebode resuscitation. A Curlew, *Numenius arquata*, and a Wheatear forsook their usual habits of resting on the ground; the former was seen a few days ago perched on a high fir-tree, and remained there until disturbed; the latter flitted before me, alighting from sprig to sprig for a considerable distance, and unceasingly uttering its melodious call-note. In spite of the persecution to which Montagu's Harrier was subjected during the past breeding-season, I occasionally see one on our heaths. A Great Bustard, *Otis tarda*, has been frequenting the high land above Fontmill, near Shaftesbury, but has lately disappeared, and unharmed.—J. C. MANSEL-PLEYDELL (Whatcombe, Blandford).

Late nesting of the Corn Bunting.—When shooting to-day (29th September), I found the newly-made nest of this bird, with three eggs, placed at the base of some thistles amongst a second growth of clover. I saw the bird fly from the nest close to my feet. The Corn Bunting is a notoriously late breeder, and we not unfrequently come across the nest with the eggs quite fresh, or only slightly incubated, in the last week in June when cutting clover. The occurrence of the nest with eggs at the end of September must, however, be considered very much beyond the ordinary season.—JOHN CORDEAUX (Great Cotes).

Woodchat in Wilts.—As the Woodchat, *Lanius pomeranus*, is not included in the Rev. A. C. Smith's 'Birds of Wilts,' the following note of its occurrence may be worth recording. On June 6th, 1884, in Savernake Forest, I saw a very brightly-coloured bird of this species. It was very tame, and I made a rough sketch of it at the time, which I afterwards compared with Dresser's plate. Then, in May, 1872, my cousin, the Rev. H. A. Macpherson, was shown, for identification, a Woodchat which had been sent, in the flesh, to a tradesman at Reading: this bird had been shot close to Salisbury.—ARTHUR H. MACPHERSON.

Black Guillemot in the Isle of Man.—Referring to the note in last month's 'Zoologist' (p. 331), it may be worth while to mention that the Black Guillemot, *Uria grylle*, has not quite ceased to breed in the Isle of Man. There was at least one colony nesting on the west coast last summer, in a locality regularly frequented by this species. In 1886 the birds were very numerous there.—P. RALFE (6, Woodburn Square, Douglas, Isle of Man).

Merlin breeding near Brecon.—As the fact of the nesting of the Merlin in this county has not, I believe, been recorded, perhaps you may think it worth notice that Mr. Edgar Thomas, on the 29th May last, found four fresh eggs which apparently belongs to this bird. He describes the hawk as being rather like a Kestrel, but smaller. He disturbed it from its eggs when walking across a heathery moor, some twelve hundred feet above the level of the sea, and about ten miles from here. The eggs were placed in a slight hollow between two tufts of heather, and there was little or no nest. The eggs are much like a Kestrel's, but smaller, the markings consist of minute specks, and there are no blotches. One of the eggs, which would well represent the whole for size, measures 1·47 by 1·18 in.—E. A. Swainson (Woodlands, Brecon).

Black Redstart in Merionethshire.—On April 5th last I shot a Black Redstart, *Ruticilla titys*, on the Traeth Maws, an extensive marsh near Penrhyndendraeth, Merionethshire. In its actions when on the ground it closely resembled a Wheatear. It proved to be an immature male, and its gizzard was filled with small beetles, most of which were still entire.—G. H. Caton Haigh (Grainsby Hall, Great Grimsby, Lincolnshire).

The Protection of Sea Birds on the Farne Islands.—We have been favoured by Mr. Hugh G. Barclay, of Colney Hall, Norwich, with a report of the results achieved by an association of naturalists in an attempt to protect the sea-birds which resort to the Farne Islands during the nesting season. He says:—"Notwithstanding a certain amount of opposition from fishermen residing near the islands, I think the birds were very fairly protected during the past breeding season. I visited the islands on three occasions, and had no reason to be dissatisfied with what I saw. My last visit was on the 21st of July, and I was glad to see large numbers of young birds of all the species which usually resort to the Farnes during the nesting season, thus proving that the means adopted for preserving the eggs had been effectual. The season was a most disastrous one, and large numbers of nestlings were destroyed by the rains and cold weather in the early part of July. This was very apparent on the Inner Farnes, where the number of dead nestlings fully confirmed the reports I had occasionally received from the watchers. My limited acquaintance with the islands previous to this year prevents me from giving any comparative statement as to increase or otherwise in any particular species of bird, but it should be borne in mind that during the breeding season of 1887 hardly a single egg was left on the islands before the 15th of June, when steps were taken to put a stop to further mischief. The following information may be interesting. The watcher on the Inner Farnes reported on the 15th July,—'I am rather doubtful I will not be able to answer your questions with anything like accuracy, but taking my nearest calculation I think there will be about 150 Sandwich Terns hatched off, and as for Arctic and Common Terns, it is impossible for me to give you any idea, for they are so numerous now. About Eider Ducks, we have about sixty-five hatched off. I have got twenty-five Sandwich Terns still sitting, and ten or twelve Eider Ducks not hatched off yet; and also a great many Arctic and Common Terns.' The watcher on the Outer Farnes, on the same date, reported:—'The Ducks, on the whole, I think show a very fair average, as I have seen a good many of their young ones.' Mr. Paynter, who for many years has taken very great interest in the birds during the breeding season, writes:—'I should say only about sixty Eider Ducks hatched off their broods, instead of a hundred. The Gulls, both Black-backed (the Lesser) and Herring Gulls are quite as numerous as ever; also the Terns, Oystercatchers, and Dotterels, about the same. Puffins and Guillemots, rather more numerous, especially the Bridled Guillemots. . . . . If the weather had been warmer, and not so wet, I think there would have been far more young birds than usual. Cormorants were much the same, about fifty nests. As far as I could make out, there were only two pairs of Roseate Terns.' Many visitors made excursions to the islands during June and July, and, except in two cases, the rules I drew up were strictly adhered to. I received many applications for leave to take eggs, but these, with one exception, I declined to grant. I gave permission to representatives from Her Majesty's Office of Works to take some young birds from the islands, for the purpose of being turned out in the lake at St. James's Park. With the exception of four or five young Puffins, they are all doing well, and next season I hope they will be an object of interest to many who frequent the Park, and who are never likely to have an opportunity of seeing such birds in their natural habitat. Some of the local fishermen were very troublesome. On several occasions they landed on the islands and took eggs away. In one instance the robbery was so open and determined, that I felt it impossible and inexpedient to pass it by without taking some steps to enforce our rights. Consequently, after consulting with Mr. Paynter, I commenced an action in the County Court against the most prominent offender, with the result that he (Robson) was fined £1 1s., and had to pay the costs of the action. This decision in our favour by His Honour, Judge Holl, I consider was most satisfactory, as it establishes the right of an owner or lessee to the eggs deposited on his property, and it will probably put a check on future robberies of eggs from the islands."

Spotted Crake in Holderness.—A bird of this species was killed on the 21st September, by flying against a roadside telegraph-wire, during its autumnal migration, between Hornsea and Beverley. The only injury visible was an abrasion of the feathers in front of the head. The Crake is in beautiful plumage, and has the appearance of a bird of the present year.—Peter Inchbald (Grosvenor Terrace, Hornsea).

Unrecorded Habits of the Starling.—Whilst sailing on the Thames just below Erith, on the 3rd June last, I was surprised to see some Starlings flying close to the surface of the water, and picking up pieces of bread floating there. When one had secured a piece, it immediately made for the bank to eat it. I also noticed the other day a Starling hawking for insects in much the same manner as the Martins flying around it; so that Starlings not only imitate other birds' notes, but also their habits.—F. Hayward Parrott (Walton House, Aylesbury).

[It is by no means unusual to see Starlings hawking for flies, in fine weather; but we do not remember to have seen them take anything off the water.—Ed.]

A projected Volume on the Birds of Essex.—Will you allow me to state that I have for more than fifteen years past been collecting materials for a work on 'The Birds of Essex,' similar to other County Avifaunas already published. The information collected will be sufficiently complete to warrant publication in the coming year. I have already enough matter to ensure for the county of Essex a high position, ornithologically speaking; but am anxious to render my information still more complete, by appealing to all who take an interest in the subject, to supply me with intelligence of the occurrence within the county of any rare, or otherwise interesting birds, not hitherto recorded. I may add that I especially desire information as to the occurrence in the county of this following:—White's Thrush, Bluethroat, Marsh Warbler, Black-bellied Dipper, Richard's Pipit, Lesser Grey Shrike, Pine Grosbeak, Ortolan Bunting, Lapland Bunting, Squacco Heron, Night Heron, Ruddy Sheldrake, White-eyed Duck, Black Grouse, Crane, Collared Pratincole, Cream-coloured Courser, and Greater Shearwater. I shall also be especially glad of further information regarding the occurrence in Essex of the Dartford Warbler, Firecrest, Black Redstart, White Wagtail, Cirl Bunting, Golden Eagle, Goshawk, Gyr Falcon, and Glossy Ibis.—Miller Christy (Chignal St. James, Chelmsford).

SCIENTIFIC SOCIETIES.

Entomological Society of London.

October 3, 1888.—Dr. D. Sharp, F.L.S., President, in the chair.

Mr. F. P. Pascoe exhibited a number of new species of *Longicornia* from Sumatra, Madagascar, and South Africa.

Dr. P. B. Mason exhibited, for Mr. Harris, a specimen of *Chærocampa Nerii*, recently captured at Burton-on-Trent.

Mr. S. Stevens exhibited a specimen of *Vanessa Antiopa*, which he caught in the Isle of Wight in August last. Mr. Stevens asked whether Mr. Poulton or any one else present could inform him why, in British specimens of this species, the border of the wings was almost invariably a pale straw-colour.

Mr. E. B. Poulton exhibited a living larva of *Smerinthus ocellatus* in the last stage, fourteen larvæ of *Boarmia roboraria* and some cocoons of *Rumia cratægata*. The object of the exhibition was to show the influence of special food plants and surroundings on the colour of the larvæ and cocoons.

Mr. M. Jacoby exhibited a varied series of *Titubæa sanguinipennis*, Lac., from Central America. He stated that many of the varieties exhibited had been described as distinct species.

Mr. Billups exhibited specimens of *Bracon brevicornis*, Wesm., bred from larvæ of *Ephestia Kühniella*. He remarked that this rare species had only been recorded as bred on two or three occasions—*viz.*, by the Rev. T. A. Marshall, Mr. W. F. Kirby, Herr Brischke, and Mr. Sydney Webb.

Mr. W. Warren exhibited specimens of *Antithesia ustulana* and *A. fuligana;* also bred series of the following species:—*Eupæcilia Degreyana*, *Stigmonota pallifrontana*, *Cacœcia decretana*, and *Gelechia peliella*.

Lord Walsingham exhibited specimens of several species of the genus *Cryptophasa* belonging to the family *Cryptolechidæ* of the Tineina, some of the most remarkable being males and females of *Zitua balteata*, Walker, bred by Mr. Sidney Olliff from pupæ found in January last, at Newcastle, New South Wales, in burrows in branches of a species of Acacia. Lord Walsingham also exhibited a male of *Zelotyphia stacyi*, received from Mr. Olliff.

Mr. F. D. Godman exhibited a larva of a *Cicada*, from Mexico, having a fungoid growth on the head.

Mr. H. J. Elwes exhibited a large number of Butterflies, representing about 180 species, recently collected by himself and Mr. Godman in California and Yellowstone Park. The collection included many species of great interest, amongst others a species described by Mr. W. H. Edwards as *Erebia Hadenii*, but which he considered would prove to be a *Cœnonympha;* a very rare species of *Thecla;* and a remarkable series of species of the genus *Colias*.

Mr. H. Goss exhibited, for Mr. W. J. Cross, an extraordinary melanic variety of *Agrotis segetum*, caught by the latter near Ely in July last.

Mr. W. L. Distant read a paper entitled "An enumeration of the *Rhynchota*, received from Baron von Müller, and collected by Mr. Sayer in New Guinea during Mr. Cuthbertson's expedition."

Mr. Poulton read a paper entitled "Notes in 1887 upon Lepidopterous larvæ, including a complete account of the life-history of *Sphinx convolvuli* and *Aglia tau*"; and Mr. White exhibited specimens of preserved larvæ of *S. convolvuli*, *A. tau*, and other species referred to in Mr. Poulton's paper.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

A History of the Birds of New Zealand. By Sir WALTER L. BULLER, K.C.M.G., Sc.D., F.R.S. Parts I—IX. Imperial 4to. Published for Subscribers, by the Author, at 8, Victoria Chambers, Victoria Street, Westminster. 1887—88.

IN July of last year Sir Walter Buller commenced the publication, in parts, of a new edition of his 'Birds of New Zealand,' the first edition of which, dated 1873, has long been out of print and scarce. Nine parts out of thirteen of the new issue have already appeared, and testify on every page to the industry and enterprise of the author. While he has adhered to the general method and style of the first edition, many alterations and additions have been made, whereby the work may now be said to represent very fairly, so far as New Zealand is concerned, the great advance which has been made in ornithological science during the interval which has elapsed since its first publication. The book itself is on a larger scale, being imperial instead of royal quarto, and the plates, inimitably drawn by Mr. Keulemans, instead of being hand-coloured lithographs, have been produced by the more costly, but more exact, process of printing in colours.

Although we must confess, that for our part we prefer hand-coloured plates for their greater softness and better perspective, it must be admitted that by chromo-lithography, the hardness of outline (especially where two bright colours come into juxtaposition) is compensated for by the greater uniformity which is secured throughout the whole edition, a result which is never obtained where hand-colouring is employed. For this reason, perhaps, most people will prefer the new plates to the old ones, and certainly many of them are beautiful examples of the chromo-lithographer's art. Each part contains facsimiles of four coloured drawings by Mr. Keulemans, under whose immediate direction all the colour-stones have been prepared, and the birds are represented as they appear in life, with accessories drawn from the native flora of the country. More than this can scarcely be desired.

That the time has fully arrived for the publication of as complete a history of New Zealand birds as can be now collected will be generally admitted; for we learn with regret, that some of the native species are already dying out, while others are being gradually driven further and further from observation by the steady advance of colonization, with all the attendant evils which threaten the extinction of a native fauna and flora. It appears to be the fact that in parts of New Zealand, one may now live for weeks and months without seeing a single example of its indigenous birds, all of which, in the more settled districts, have been supplanted by the aliens that have been imported;* while further inland these last are daily extending their range at the cost of the endemic forms.

Professor Newton, in his Address to the Biological Section of the British Association at Manchester in 1887, put the case very well when he stated that these indigenous species are, with scarcely an exception, peculiar to the country, and from every scientific point of view are of the most instructive character. "They supply (as he says) a link with the past, that once lost can never be recovered; and it is, therefore, incumbent upon us to know all we can about them before they vanish. The forms that we are allowing to be killed off, being almost without exception ancient forms, are just those that will teach us more of the way in which life has spread over the globe than any other recent forms; and for the sake of posterity, as well as to escape its reproach, we ought to learn all we can about them before they go hence and are no more seen."

This excellent advice has not been lost upon the author of the present work, who has not only given an admirable description of every bird peculiar to New Zealand, but in an exhaustive Introduction has given a general view of this singular avifauna, both past and present, with clear diagnoses of the genera, accompanied by well-drawn woodcuts of the most important structural characters.

The first edition of this work (1873) contained descriptions of 147 species, and in his 'Manual of the Birds of New Zealand,' prepared at the request of the Colonial Government in 1882, 29 more species were added to the list. The present edition does not profess to add many more to the number; but the classification and nomenclature have been revised, and a far more complete history has been given of each species than was possible before, seeing that the author has for a further period of fourteen years, enjoyed favourable opportunities for becoming better acquainted with the subject.

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* The North-Island Thrush, *Turnagra hectori*, is said to be "rapidly dying out," while our English Song Thrush is "fast becoming established" (Introduction, p. xliii.).

In regard to classification, he has departed considerably from the system followed in his first edition, but this he considered inevitable in order to keep pace with the progress of ornithological science.

The feature that first strikes the ornithologist in New Zealand, is the comparatively large number of apterous birds, or species in which the anterior limbs are so feebly developed as to be absolutely useless for purposes of flight. Conspicuous amongst these are the four species of *Apteryx*, the various kinds of *Ocydromus*, and the remarkable Ocydromine form, *Cabalus*, from the Chatham Islands; then the huge brevipinnate Rail, *Notornis;* a small flightless Duck, *Nesonetta aucklandica*, confined to the Auckland Islands; and finally the well-known Ground Parrot, *Stringops habroptilus*, in which the sternum is almost devoid of a keel. "The explanation in all these cases," says Sir Walter Buller, "is sufficiently obvious. In a country like New Zealand, where there have been no indigenous mammalia, and consequently (?) few birds of prey, species that habitually seek their food on the ground have no inducement to take wing, and from long disuse, continued perhaps through countless generations, lose the carinate character of the sternum, and with it the faculty of flight; for without the keel on the breastbone to give attachment to the great pectoral muscles, the wings, however ample they may be in their outward development, are practically useless for purposes of flight."

Another remarkable feature in connection with the carinate birds of New Zealand, is the number of endemic genera and species. Out of a total of 181 species no less than 93 are strictly endemic; and even among the most widely distributed orders, there are genera restricted in their range to the New Zealand rivers or coasts, or to the outlying islands. Thus among the Limicolæ there are two strictly peculiar genera, *Thinornis* and *Anarhynchus*, and among the Anseres two more, namely *Hymenolæmus* and *Nesonetta*.

The absence of Woodpeckers might have been expected, as these birds do not extend beyond Celebes, never having been met with in the Moluccas, or in Polynesia, New Guinea, or Australia; but it is difficult to account for the non-appearance of Swifts and Swallows, except as occasional visitants from Australia. Parrots, on the other hand, are well represented. Besides the very typical *Stringops habroptilus*, there are seven species belonging to the genera *Platycercus* and *Nestor*, all of which are peculiar to New Zealand and her satellites. On the subject of Cuckoos, Sir Walter Buller has some interesting observations:—

> "We have," he says, "in New Zealand two species of Cuckoo belonging to different genera, both migratory and both parasitic. One of these, the Long-tailed Cuckoo, which is a native of the Society Islands, visits us in the summer and breeds here, entrusting the task of rearing its young to a little warbler not larger than an English Wren. It arrives year after year during the second week of October, and leaves again before the end of February—this migratory habit, persevered in through long generations, having become a necessary part of its natural existence. In the whole range of ornithological biography there is perhaps nothing more marvellous than this punctual annual migration across some 1500 miles of ocean. The other species, known as the Shining Cuckoo, visits us from Australia, performing its journey of 1000 miles with the same wonderful precision as to dates of arrival and departure, my register showing a maximum variation of only five days during a continuous period of ten years. Curiously enough, this wild little caterpillar-hunter entrusts the rearing of its young to the same bird that performs that friendly office for its predatory congener four times its size." (Introduction, p. xli.).

Further on (p. lv) he remarks:—

> "Seeing that the Shining Cuckoo (*Chrysococcyx lucidus*) is met with in New Guinea, and probably further west, that it is likewise found in tropical Australia, and that it comes to us from the north, or north-west,—for it always makes its appearance first at the extreme north,—it is easy to understand that the migratory impulse has been inherited from time immemorial, and the more so as the closely-allied species (*C. plagosus*) is also a summer visitant to the temperate and southern portions of Australia. But it is very difficult to imagine why the Long-tailed Cuckoo (*Eudynamis taitensis*), which hibernates in the warm islands of the Pacific, ranging over more than 40° of longitude, should make its annual pilgrimage across 1500 miles of ocean to New Zealand."

Here, for the present at least, we must take leave of our author, although there is very much more in his Introduction that we should like to quote, particularly his remarks on the geographical relations of the New Zealand avifauna. We can only add that whosoever desires to have a clear exposition of the character and extent of this remarkable Ornis, should read carefully the pages xiii to lviii of the Introduction, after which the detailed descriptions and life-history of the various species as they are successively dealt with, leave practically nothing to be desired.

Curious Creatures: their Ways and Habits. By Marianne Bell. Post 8vo, pp. 266. London. 1888.

In this little volume we have a collection of essays which were originally contributed to a magazine, and many of them possess considerable literary merit. But while there is much truth and pleasant reading in some of the chapters, there is here and there a leaven of heterodox teaching, against which the unwary reader should be placed on his guard. For example, one is scarcely prepared at the present day to read that "among the most remarkable of all the insects of the sea are the heavy armour-covered crab and lobster."

To such a sentence also as the following exception must be taken:—"The whole of the forelimb of birds is so constructed as to form the wing, which is useless except for flying." The author has overlooked the fact that in the case of Penguins, which are incapable of flight, the wings are extremely useful to them in their progress under water; while many birds, like the Common Guillemot and Razorbill, employ their wings in swimming as well as in flying.

A belief in dragons is implied in the statement that "Bats may be said to resemble dragons in being possessed of an equivalent to wings and forelimbs provided with claws, though they greatly differ in regard to their size and power of destruction."

The chapter on Frogs and Toads contains a few inaccuracies; for instance, the following:—"Thus we see the Tadpole is a fish, swimming with a fish's tail, gulping in water at his mouth and passing it out at the holes in his throat after it has been poured over his fish-gills." The many elementary works on Biology, in which the anatomy of the Frog is minutely described, ought to have saved the writer from this misapprehension.

Occasionally the want of acquaintance with some of the species referred to has led to misleading statements. For example, we are told that "the beautiful Otter in the museum of the Zoological Gardens (*sic*) is from Ireland, and is by some considered as a distinct species. It is chiefly found on the coast of Antrim," &c. There is, of course, only one species of Otter in the British Islands.

But we need not multiply instances of this kind, nor call particular attention to old fables revived. The reader who is sufficiently well versed in natural-history lore will be able to steer clear of such shoals and quicksands, and will find in many of the chapters much that is entertaining. The value of many statements which are undoubtedly accurate would have been enhanced had the species been named and the authority quoted. For example, it might have been well to give the name (*Birgus latro*) of the Great Cocoa-nut-eating Crab of the Philippines and elsewhere, which is noticed on p. 41, and refer the reader to the excellent account which is given of it in Forbes's 'Naturalist's Wanderings in the Eastern Archipelago.' One sees at a glance that the writer has a taste for Zoology, and has compiled from a good many authors; but for want of experience, has not always been able to separate the wheat from the chaff. We trust, however, that this criticism will not deter our readers from looking into the book, nor prevent its author from continuing a course of studies for which she has such aptitude, and which will soon overcome such shortcomings as we have briefly noticed.

British Birds: their Nests and Eggs. By W. Harcourt Bath. Small 8vo, pp. 112. London: Swan Sonnenschein & Co. 1888.

Unless for the purpose of forming one volume of a series of so-called "Young Collectors' Handbooks," without which the series would be considered incomplete, we cannot see that any need for such a volume as this exists. There are already several works on British Birds and their Eggs, in which the latest and best information may be found, and which, moreover, are well-illustrated. Cheapness is no recommendation unless the information supplied is accurate, however briefly it may be expressed, and this condition is not fulfilled in the present treatise. The opening sentence of the "Introduction" shows that the writer's acquaintance with the literature of the subject must be very slight, if he believes that modern ornithologists are agreed to group the 12,000 species of birds which have been described and named, in so few as five Orders. For such a one surely the views of Huxley, Garrod, Newton, Sundevall, and Sclater have been propounded in vain, and even the latest edition of 'Yarrell' (now made so accessible in price) can scarcely have been consulted.

With such an admirable series of preparations in the Natural History Museum, expressly designed to show the structure of a bird's wing, and in view of recently-published papers in 'The Ibis' and the 'Proceedings' of the Zoological Society, we should not have expected so many mistakes as appear in the first two pages of this "Handbook." Nor are the writer's views on classification either clear or orthodox. To confuse "classes" with "families," and to unite in one Order the *Passeres* and *Picariæ*, in another the *Columbæ* and *Gallinæ*, is to show a complete disregard for the teaching of modern systematists.

On taking up this little book, we were disposed to regard it favourably, as a healthy sign of the times, and likely to encourage a taste for Ornithology, while imparting accurate, if elementary, knowledge; but when (in addition to the above-mentioned failings) we read such items of intelligence as that "White's Thrush is supposed by some to be a mere variety of the Song Thrush"; that the eggs of the Goshawk are "generally a little more *ruddy* in appearance" than those of the Common Buzzard; that "the Capercaillie is not an indigenous British bird, having been introduced into this country by artificial means for purposes of sport"; that "the Red-legged Partridge was formerly considered a very rare bird in this country, but has of late years made its way over here from adjacent parts of the Continent, and has on several occasions been known to breed here"; and that "the Virginian Colin, though an occasional visitor to this country, has never been known to breed here";* we close the book in despair for "the Young Collector."

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* It may seem paradoxical, though it would be nearer the truth to assert that "this bird, although *not* an occasional visitor, has *often* been known to breed here"! Great numbers have been imported at various times from America, and turned out with more or less success in many parts of England.

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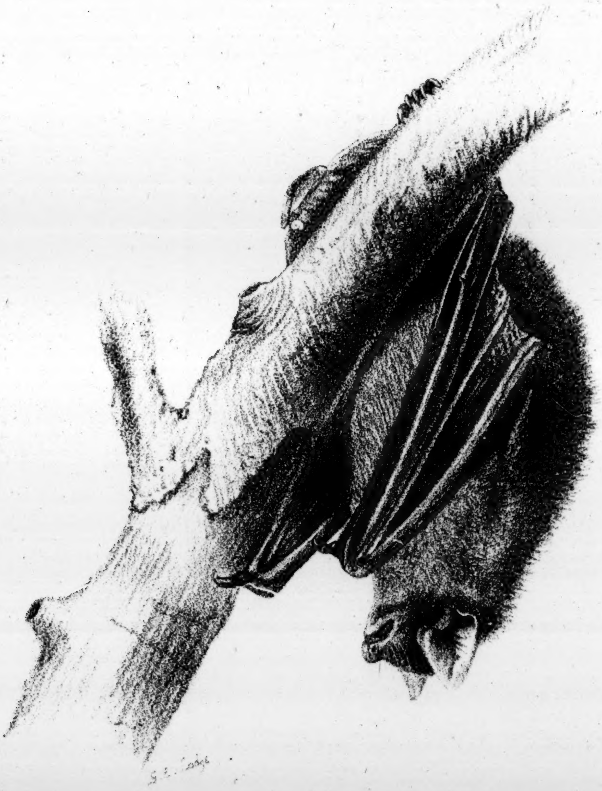

L. Hutchinson lith.

West, Newman & Co. imp.

Whiskered Bat.
Vespertilio mystacinus.